

# New Records and Species of Malayan Membracidae.

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(Contribution from the Zoological Laboratory of the University  
of Kentucky).

In a previous paper<sup>1</sup> record was made of an interesting collection of Membracidae taken by Professor C. F. Baker of Los Banos, P. I., at Singapore and on the Island of Penang during the Summer of 1917.

More recent collecting by Professor Baker has yielded additional new records and species from the Peninsula and from Borneo which are of particular value in adding to our knowledge of the distribution of the species of this family of insects. A comparison of the list of genera and species here recorded with those described from the more distant parts of the mainland<sup>2</sup> and with those inhabiting the Philippine Islands<sup>3</sup> and Ceylon<sup>4</sup> brings out some very suggestive data regarding the extents of faunal areas throughout the East Indies which will be of interest to the zoogeographer.

All of the species here listed were collected by Professor Baker to whom I am indebted for the opportunity of studying the material.

## 1. *Centrochares borneensis* Distant.

1916. *Centrochares borneensis* Dist. Rhynchotal Notes  
p. 314.

One male and two females from Sandakan, Borneo. This species is very close to *C. horrificus* Westwood but differs in size, slightly in color, and in the shorter and differently shaped pronotal horns. This is the first record of this species since its original description<sup>5</sup>.

1 Malayan Membracidae. Journ. Straits Branch R. A. Soc., No. 79, pp. 1-14.

2 Cf. Distant, W. L. Fauna of British India, Rhynchota IV: pp. 1-78, 1907 and Appendix pp. 146-182 1916.

3 Cf. Funkhouser, W. D. Notes on the Philippine Membracidae, Philippine Journal of Science, Vol. XIII: No. 1, pp. 37-38.

4 Cf. Melichar, L. Homopteren-Fauna von Ceylon, pp. 108-125, 1903.

5 Distant, W. L. Rhynchotal Notes LIX, Ann. & Mag. Nat. Hist., Ser. 8, Vol. xvii, p. 314, April, 1916.

**2. *Leptocentrus leucaspis* Walker.**

*Add*—Locality: Sandakan, Borneo.

One female bearing Baker's duplicate No. 9509. This specimen is somewhat larger and darker than the forms of the species taken at Singapore but I can find no specific differences. It may be a separate variety but could not be so designated on a single specimen.

**3. *Leptocentrus obortus* Distant.**

*Add*—Locality: Sandakan, Borneo.

One specimen (Baker's duplicate No. 9407) agreeing in all respects with an unnumbered specimen from Singapore.

**4. *Leptocentrus longispinus* Distant.**

*Add*—Localities: Sandakan, Borneo; Island of Penang.

Two specimens, both males, one from Borneo and the other from Penang, differing slightly in the amount of divergence of the pronotal horns, the one from Borneo showing somewhat the wider spread across the tips, but otherwise similar.

**5. *Centrotypus securis* Buckton.**

1903. *Centrotypus securis* Buckt. Mon. Memb. p. 238, Pl. 54, Fig. 4.

1907. *Centrotypus securis* Dist. Fauna Brit. Ind. p. 34, No. 2147.

1916. *Centrotypus securis* Dist. Fauna Brit. Ind. App. p. 156.

One male and two females, all from Sandakan, Borneo. If I am determining this species correctly, it is very close to *Centrotypus flexuosus* Fabr. The suprahumeral horns are longer and the tegmina slightly different in colour.

**6. *Centrotypus asmodeus* Distant.**

*Add*—Locality: Sandakan, Borneo.

Two males and one female.

**7. *Centrotypus shelfordi* Distant.**

1916. *Centrotypus shelfordi* Dist. Rhynch. Notes p. 315.

One male (Baker's duplicate No. 9822) taken at Sandakan, Borneo. This species should be easily recognized by the very wide-spreading laminate suprahumeral horns.

8. **Centrotypus brunneus** sp. nov. (Figs. 1 and 2).

A large robust species, entirely brown; roughly punctate; sparingly pubescent; suprahumeral horns very sharp, extending outward and curving upward; posterior process long, slender, sharply carinate above and extending to a point about midway between internal angle and tip of tegmen; tegmina entirely brown, wrinkled, sparsely pilose, coarsely punctate at base; legs and under-surface of body brown.

Head subquadrangular, wider than long, entirely and uniformly brown, roughly sculptured, coarsely punctate, sparingly pubescent with grayish hairs; base of head convex above, highest above ocelli; eyes very large, very prominent, grayish-brown, extending beyond lateral margins of adjoining pronotum; ocelli very large, grayish-brown, farther from each other than from the eyes and situated somewhat above a line passing through centres of eyes; clypeus heavy, brown, roughly sculptured, punctate, sparsely pubescent with grayish hairs twice as long as wide, extending for more than two-thirds its length below the inferior margins of the genae, the tip subtruncate and almost as wide as the base, lateral margins slightly expanded just below inferior line of head.

Pronotum entirely brown, roughly punctate, sparingly pubescent with grayish hairs; metopidium nearly perpendicular, very slightly convex above, three irregular smooth callosities on each side above lateral margins of head; humeral angles large, prominent, auriculate; suprahumeral horns sharp, curved, projecting at first nearly horizontally as seen from the front and then distinctly curving upward, about as long as the distance between their bases, flattened dorso-ventrally, irregularly rugose above, bicarinate below, tips slightly bent backwards, distinct depression on each side between base of horn and base of humeral angle; median carina percurrent, sharply ridged behind suprahumeral horns; dorsum sloping, only slightly gibbous before base of posterior process; scutellum distinctly exposed on each side, brown; posterior process long, slender, nearly straight, very slightly sinuate above, somewhat decurved at tip, dorsal carina high and sharp, a strong lateral carina on each side at base extending from behind base of suprahumeral horn to lateral margin of process about one-third the distance from the tip, tip acuminate, extending beyond the tip of the abdomen and to a point about half-way between the internal angle and the apex of the tegmen.

Tegmina entirely brown, wrinkled, semi-translucent; veins more or less curved in central area; basal half coarsely punctured and sparingly pilose with grayish hairs; five apical and three discoidal areas. Hind wings hyaline, veins blackish, four apical areas.

Undersurface of body brown, sides of mesothorax covered with dense golden pubescence, abdomen darker. Legs brown, tips of tarsi and claws darker, nearly black on the posterior pair.

Length 8 mm.; width between tips of suprahumeral horns 6 mm.

Type: female.

Locality: Sandakan, Borneo.

Unique type in Professor Baker's collection.

#### 9. *Micreune macularum* Buckton.

1903. *Micreune macularum* Buckt. Mon. Memb. p. 213, Pl. 47, Figs. 7, 7a, 7b.

One female (Baker's duplicate No. 9507) taken at Sandakan, Borneo. This specimen agrees in all respects with Buckton's description and figures. Since the type was described from Borneo I have no doubt but that Professor Baker has here discovered for the species the first new record since its original description.

#### 10. *Micreune formidenda* Walker.

1856. *Micreune formidenda* Walk. Journ. Linn. Soc. I: 93, 49.

1857. *Micreune formidenda* Walk. Journ. Linn. Soc. I: 164.

1858. *Micreune formidenda* Walk. List Hom. Brit. Mus. Suppl. p. 164.

1903. *Micreune formidenda* Buckt. Mon. Memb. p. 213, Pl. 47, Figs. 6, 6a.

1903. *Micreune formidenda* Buckt. Mon. Memb. p. 268.

1915. *Micreune formidenda* Dist. Rhynch. Notes p. 328.

Two specimens, both females (Baker's duplicate Nos. 9505 and 9506), of this very interesting and bizarre Membracid taken at Sandakan, Borneo. Distant has already reported this species from both Singapore and Borneo<sup>1</sup> and states that another specimen of the same species stands in the British Museum collection under the MS. name of *M. quadrilinea*, labelled by Walker but apparently not described.

#### 11. *Periaman limbatus* Walker.

1857. *Centrotus limbatus* Walk. Journ. Linn. Soc. I: p. 163, No. 116.

One female (Baker's duplicate No. 9824) collected at Sandakan, Borneo. This is a fine large insect and is easily recognized by its almost straight dorsum and the very striking yellow markings on the pronotum.

<sup>1</sup> Distant, W. L. Rhynchotal Notes LVI, Annals and Magazine of Natural History, Ser. 8, Vol. xvi, p. 328, Oct., 1915.

**12. *Anchonoides variegatus* Funkhouser.**

*Add*—Locality: Sandakan, Borneo.

Three males and one female. The unique type of the species came from Singapore and it is most gratifying to find additional specimens as well as a new locality recorded.

**13. *Anchonoides serpentinus* sp. nov. (Figs. 3 and 4).**

Entirely black with meagre white pubescence: posterior process very strongly sinuate, apex suddenly acute; suprahumeral horns horizontal, very thin and sharp; scutellum entirely exposed; tegmina hyaline with brown veins on apical three-fourths, basal fourth black, coriaceous and punctate, second costal cell from the base black, coriaceous, punctate and pubescent; undersurface of body black; legs black with yellowish bands on second and third tibiae and tarsi.

Head subquadrangular, about as long as wide, black, roughly sculptured, finely punctate, densely pubescent with whitish hairs; base sinuately convex; eyes large, prominent, brown; ocelli large, dark brown, farther from each other than from the eyes and situated slightly above an imaginary line drawn through centres of eyes; clypeus twice as long as wide, projecting for two-thirds its length below the inferior margins of the genae, black, finely punctate, densely pubescent with sordid-white hairs, tip truncate, lateral margins sinuate; inferior margins of genae having a slight angle on each side about one-third the distance from the clypeus.

Pronotum black, finely punctate, longitudinally striate with grayish-white pubescence; metopidium sloping, punctate, with five longitudinal stripes of whitish pubescence, one extending down median line, one on each side just above suprahumeral horn and another on each side between bases of suprahumeral horns and humeral angles, smooth callosity above each eye; humeral angles prominent and blunt; suprahumeral horns very thin and sharp, arising from a point about midway between the crest of the dorsum and the humeral angles and extending directly outward; median carina weakly percurrent; posterior process very strongly sinuate, one high loop just above the scutellum, another just above internal angle of tegmen, both loops high and bearing lateral carinae, the posterior loop much swollen, tip suddenly acuminate, slender, sharp, extending far beyond the abdomen and almost reaching apex of tegmen; scutellum entirely exposed black, punctate, sparingly pubescent, the base upraised and swollen, the tip strongly bidentate.

Tegmina hyaline for apical three-fourths; base black, coriaceous and punctured; internal angle and apical margin brown; veins distinctly nodulate in central area and strongly brown in apical area; second cell from the base on the costal margin very strongly and sharply black, coriaceous, punctate and pubescent.

Undersurface of thorax uniformly black, irregularly pubescent with white hairs. Abdomen ringed with white and black; the two apical segments black, the next four segments white, the next segment black, the next segment white and the basal segments black, the white segments irregularly but strongly punctate with black dots; the colors of the abdomen easily described through the hyaline portions of the wings.

Legs black with the exception of the basal joints of the tarsi which are white or yellowish and a broad luteous band near the apices of the tibiae of the last two pairs of legs. Tibiae minutely spined and nodulate. Claws strong and black.

Length 6 mm.; width between tips of suprahumeral horns 4 mm.; length of each suprahumeral horn 1 mm.

Type: female (Baker's duplicate No. 9825).

Locality: Sandakan, Borneo .

Type in author's collection.

This is a very striking and distinct species and should be at once recognized by the strongly bisinuate posterior process, the slender suprahumeral horns and the black cell of the tegmen.

#### 14. *Tricentrus pronus* Distant.

1916. *Tricentrus pronus* Dist. Fauna Brit. Ind. App. p. 166, No. 3368.

Two specimens, both females, from the Island of Penang. This species is close to *T. gibbosulus* Walk., but differs in the shape and direction of the suprahumeral horns.

#### 15. *Tricentrus allabens* Distant.

1916. *Tricentrus allabens* Dist. Fauna Brit. Ind. App. p. 166, No. 3367.

Two females, one from the Island of Penang and one (Baker's duplicate No. 9826) from Sandakan, Borneo. In the Borneo specimen the horns are sharper and slightly more recurved than in the specimen from Penang; it agrees more closely with Distant's original description and figure. The Penang specimen may be a variety but I should not like to separate it on the basis of a single specimen. Both specimens have the characteristic white transverse fascia following the black basal area of the tegmen.

#### 16. *Tricentrus truncaticornis* Funkhouser.

Add—Locality: Sandakan, Borneo.

One male specimen. This is without doubt the male of *T. truncaticornis* and is the first record for the sex. The species was described from a female from Singapore with which type specimen the Borneo insect has been compared.

**17. *Tricentrus albomaculatus* Distant.**

Three females, one from the Island of Penang (Baker's duplicate No. 9388) and two (one bearing Baker's duplicate No. 9406) from Singapore. This species has been previously reported from both these localities<sup>1</sup> as well as from other parts of South India<sup>2</sup> and is apparently common throughout the Peninsula.

**18. *Tricentrus brunneus* Funkhouser.**

*Add*—Localities: Sandakan, Borneo; Island of Penang.

Two specimens, both females. It is interesting to note that this species was described from a female from Singapore<sup>3</sup> and that the male has never been recorded. The suprahumeral horns in the Borneo specimen are slightly longer than in the type specimen but I can find no specific differences.

**19. *Tricentrus assamensis* Distant.**

One male (Baker's duplicate No. 9403) from Singapore. The species which I am determining as *assamensis* is apparently subject to considerable variation and has a wide range. It has previously been reported from Singapore<sup>4</sup>; Distant records it from Assam<sup>5</sup> and I have a series from Teppakulam collected by the Rev. L. V. Newton in 1915. The variation shown in the specimens from different districts is chiefly in size and I can find no characters which would warrant the splitting of the species in the material at my disposal.

**20. *Tricentrus repandus* Distant.**

1916. *Tricentrus repandus* Dist. Fauna Brit. Ind. App. p. 163, No. 3362.

Two females, one from Sandakan, Borneo, and one from the Island of Penang. This species has not been previously reported from either of the above localities.

**21. *Tricentrus congestus* Walker.**

1858. *Centrotus congestus* Walk. Ins. Saund. p. 79.

1868. *Centrotus congestus* Walk. Journ. Linn. Soc. X: p. 187.

1886. *Centrotus* (?) *congestus* Atkins J. A. S. B. 55, p. 197.

1906. *Centrotus congestus* Oshan. Pal. Hem. 43, 158.

1907. *Tricentrus congestus* Dist. Fauna Brit. Ind. p. 54, No. 2179.

1 Funkhouser. Malayan Membracidae, p. 6, 1918.

2 Distant. Fauna British India App., p. 166, 1916.

3 Funkhouser. Malayan Membracidae, p. 7, 1918.

4 Journal Straits Branch R. A. Soc., No. 79, p. 6, 1918.

5 Fauna British India, p. 57, no. 2186, 1907.

1916. *Tricentrus congestus* Dist. Rhynch. Notes p. 329.

1916. *Tricentrus congestus* Dist. Fauna Brit. Ind. App. p. 167.

Two females, one from Singapore and one (Baker's duplicate No. 9386) from the Island of Penang. Since this species was originally described from Hindustan<sup>1</sup> and has since been recorded from Darjeeling (Mann), Calcutta and Tenasserim (Doherty)<sup>2</sup>, it apparently has a wide range. The specimens from the Singapore region seem to answer fully the original description by Walker and the more recent description by Distant and if they are not *congestus* they are so near it that it would be unwise to consider them as new and they must accordingly be placed temporarily at least under this species.

**22. *Tricentrus resectus* Distant.**

Add—Locality: Sandakan, Borneo.

Five specimens, one (Baker's duplicate No. 9404) from Singapore and four (two of which bear respectively Baker's duplicate Nos. 9394 and 9827) from Borneo. All of the specimens are females but the male has been previously recorded from Singapore.<sup>3</sup>

**23. *Tricentrus gibbosulus* Walker.**

Add—Locality: Sandakan, Borneo.

A series of twenty specimens collected as follows: two males from Singapore (one bearing Baker's duplicate No. 9405); four males and two females from the Island of Penang, two of the males bearing Baker's duplicate Nos. 9382 and 9383 respectively and two of the females 9385 and 9387 respectively; five males and seven females from Borneo, the males including Baker's duplicate Nos. 9517 and 9518 and the females Nos. 9318, 9516 and 9828.

The species has already been reported from Singapore and the Island of Penang at which localities they were collected by Professor Baker during the Summer of 1917.

The males of this species are somewhat smaller and darker than the females and both sexes show some variations in the length and position of the suprahumeral horns.

**24. *Tricentrus flavipes* Melichar.**

1914. *Tricentrus flavipes* Melichar, Notes Leid. Mus. p. 112.

One female from the Island of Penang.

**25. *Tricentrus nigris* sp. nov. (Figs. 5 and 6).**

Entirely black except the apices of the tegmina which are ferruginous; coarsely and closely punctate, very sparingly pubes-

1 Walker, Francis. Insecta Saundersiana, p. 79, 1858.

2 Distant, W. L. Fauna British India IV: p. 54, 1907.

3 Journ. Straits Branch R. A. Soc., No. 79, p. 6, No. 13, 1918.



cent: suprahumeral horns sharp, compressed dorso-ventrally, extending outward and upward, tips slightly curved backwards, about as long as the distance between their bases; posterior process carinate, sharp, extending beyond the abdomen but not reaching apices of tegmina: scutellum plainly exposed on each side: tegmina ferruginous-hyaline, black and punctate at base; hind trochanters strongly armed with teeth; legs and undersurface of body black.

Head broader than long, subtriangular, black, the fine punctures almost entirely hidden by close, short, silvery pubescence; base of head sinuately convex; eyes larger, prominent, brown; ocelli not prominent, translucent blackish-brown, about equidistant from each other and from the eyes and situated somewhat above a line drawn through centres of eyes; inferior margins of genae straight; clypeus a little longer than wide, black, punctate, pubescent, extending for half its length below inferior margins of genae, tip rounded and pilose.

Pronotum black, coarsely punctate, sparingly pubescent; metopidium perpendicular, slightly convex above, weakly pubescent above the eyes and bearing an irregular callosity above the inner angle of each eye; median carina percurrent, weak over metopidium and sharply ridged over posterior process; dorsum weakly sinuate, lowest directly over scutellum and at tip of posterior process; humeral angles prominent, auriculate; suprahumeral horns strong, sharp, flattened dorso-ventrally, broad as seen from above, narrow as seen from in front, the posterior edge bicarinate, each horn about as long as the distance between the bases of the horns and extending outward and upward with the tip slightly recurved; scutellum broadly exposed on each side, black, punctate, sparsely pubescent, tip bidentate; posterior process long, heavy, sharp, punctate, not pubescent, strongly ridged on dorsal median line, weakly carinate just above lateral margins, tip acute, slightly decurved, extending beyond the abdomen and to a point about midway between the interior angle and the apex of the tegmen.

Tegmina ferruginous-hyaline, wrinkled, appearing darker in the central portion where the black abdomen shows through; base black coriaceous, punctate, sparingly pubescent; veins heavy, black in central area and ferruginous in apical area.

Undersurface of body black: sides of mesothorax and metathorax densely pubescent with yellowish hairs: abdomen entirely black.

Legs black or black-brown; tibiae minutely spined; tarsi brown or ferruginous: hind trochanters strongly armed with teeth.

Length 7 mm.; width between tips of suprahumeral horns 5 mm.

Type: male.

Locality: Sandakan, Borneo.

Type (Baker's duplicate No. 9514) and allotype (Baker's duplicate No. 9400) in author's collection. The female is about the same size as the male and shows no difference in color or markings.

**26. *Tricentrus brevicornis* sp. nov.** (Figs. 7 and 8).

Small, black; suprahumeral horns very small; posterior process heavy, short, extending just to interior angle of tegmen; tegmina dark brown with white spot at apical angle and with the base black, coriaceous and punctate; trochanters, femora and proximal ends of tibiae black; distal ends of tibiae ferruginous; tarsi and claws flavous.

Head wider than long, entirely black, finely punctate, sparsely pubescent; base sinuate; eyes large, prominent, brown; ocelli very conspicuous, shining, translucent, luteous, somewhat farther from each other than from the eyes and situated slightly above a line drawn through centres of eyes; inferior margins of genae sinuate; clypeus longer than wide, much reflexed, extending for about half its length below inferior margins of genae, black, punctate, tip slightly pilose.

Pronotum entirely black, coarsely punctate, very sparingly pubescent with weak short hairs; metopidium convex, broader than high, coarsely punctate; median carina strongly percurrent over both metopidium and posterior process; humeral angles large, prominent, extending laterad farther than the suprahumeral horns; suprahumeral horns very small and short, wider than high, flattened dorso-ventrally, hardly more conspicuous than a large carina would be and resembling more a fold than a horn, extending outward and upward but not reaching as far laterad as the humeral angles below them, about as far, in fact, as the lateral margins of the eyes and not extending much higher than the crest of the dorsum; scutellum plainly exposed on each side, black, punctate, sparingly pubescent; posterior process short, heavy, entirely black, coarsely punctate, not pubescent, strongly ridged above, tip slightly upraised and extending just to the internal angle of the tegmen.

Tegmina dark brown, wrinkled; base black, coriaceous and punctate; small area around internal angle white and subhyaline; veins prominent and black; five apical and two discoidal areas.

Undersurface of body entirely black; ventral segments of thorax finely punctate; sides of mesothorax and metathorax sparingly pubescent.

Legs black with the distal extremities of the tibiae ferruginous and the tarsi and claws luteous or flavous. Hind trochanters armed on the internal surface with strong teeth.

Length 4 mm.; width between extremities of suprahumeral horns 1.7 mm.; between tips of humeral angles 2.2 mm.

Type: male.

Locality: Sandakan, Borneo.

Unique type in Professor Baker's collection.

This species is most interesting in that it seems to show a transition form approaching the genus *Centrotoscelus*. The genus *Centrotoscelus* is separated from *Tricentrus* chiefly by the fact that in the former genus the suprahumeral horns are absent. The species of *Tricentrus* here described as *brevicornis* has the smallest and least conspicuous suprahumeral of any species of that genus hitherto reported.

## 27. *Sipylus dilatatus* Walker.

Add—Locality: Sandakan, Borneo.

Two males and one female from Borneo, the males bearing respectively Baker's duplicate Nos. 9401 and 9531.

This species is apparently widely distributed throughout the East Indies. Specimens in my collection from the Philippines have been compared by Mr. W. L. Distant with Walker's type in the British Museum and pronounced identical. The Borneo material agrees in every respect with the Philippine forms, as do also specimens previously collected by Professor Baker at Singapore. The species is easily recognized by the triangular pronotum, the absence of spines on the trochanters and the very nodulate veins of the tegmina.

## 28. *Centrotoscelus borneensis* sp. nov. (Figs. 9 and 10).

Pronotum rich ferruginous-brown, finely punctate, closely pubescent with silvery hairs; tegmina ferruginous-hyaline, base dark brown and punctate, tip brown; no suprahumeral horns; posterior process extending just beyond internal angles of tegmina; undersurface of body dark brown; legs ferruginous; hind trochanters armed on internal surface with strong teeth.

Head about as long as wide, dark brown, the fine punctuation almost entirely hidden by the dense silvery pubescence; base of head convex, very weakly sinuate; eyes large, prominent, light brown; ocelli large, prominent, glassy, about twice as far from each other as from the eyes and situated well above a line drawn through centres of eyes; inferior margins of genae weakly sinuate, reflexed, sloping downward from eyes to margins of clypeus; clypeus longer than wide, much deflexed, brown, punctate, pubescent, tip-rounded and flanged.

Pronotum uniform ferruginous-brown, finely punctate, pubescent with silvery hairs; metopidium broader than high, rich brown punctate, pubescent, slight callosity over inner angle of each eye, not carinate in centre; humeral angles large, prominent, blunt, dorsum convex over humeral angles, depressed over scutellum, straight on posterior process; median carina not pereurrent, plainly indicated on

posterior process but obsolete over anterior half of pronotum: scutellum exposed on each side, brown, punctate, sparingly pubescent: posterior process straight, heavy, blunt, carinate above, tip extending barely beyond internal angle of tegmen.

Tegmina ferruginous, subtranslucent, wrinkled, iridescent; base dark brown, coriaceous, punctate, pubescent; apical margin and about one-fourth of apical cells marked with brown, region of internal angle lighter in color than the rest of the tegmen; veins heavy, dark brown; five apical and two discoidal cells, the venation agreeing with that of the genus *Tricentrus*.

Undersurface of body very dark brown; sides of thorax finely punctate and closely pubescent; trochanters and femora dark brown, tibiae and tarsi ferruginous; hind trochanters strongly armed with teeth on internal surface.

Length 4.8 mm.: width between extremities of humeral angles 2.6 mm.

Type: female (Baker's duplicate No. 9520).\*

Locality: Sandakan, Borneo.

Type in author's collection; paratype in Professor Baker's collection.

## 29. *Centrotoscelus brevispinis* sp. nov. (Figs. 11 and 12).

Near the preceding but larger and differing in the shape and length of the posterior process and in the maculations of the tegmina.

Large and robust; head black; pronotum brown, punctate, pubescent; no suprahumeral horns: posterior process short, sharp, tricarinate, tip acute and extending just to the internal angles of the tegmina; tegmina smoky hyaline, base black, veins of central area black and upraised; undersurface of body dark brown; tibiae and tarsi ferruginous.

Head black, coarsely punctate, sparingly pubescent, wider than long, roughly sculptured; base sinuate; eyes large, prominent, dark brown; ocelli prominent, somewhat elevated, yellowish, somewhat farther from each other than from the eyes and situated slightly above a line drawn through centres of eyes; inferior margins of genae weakly sinuate, slightly protruding; clypeus black, punctate, pilose with yellowish hairs, longer than wide, extending for more than half its length below inferior margins of genae, tip truncate and densely pilose.

Pronotum dark ferruginous-brown except just above the head where the color is much darker, finely punctate, rather densely pubescent; metopidium sloping, a little wider than high, black on lower third and brown above, an irregular callosity above internal angle of each eye, no central carina; humeral angles large, prominent, triangular, blunt; dorsum convex above humeral angles, sloping before posterior process; scutellum largely exposed on

both sides, very densely pubescent with yellowish or golden hairs; posterior process short, nearly straight, strongly tricarinate with a median ridge above and a lateral ridge on each side just above lateral margin, extreme tip very sharp, black, extending just to internal angle of tegmen.

Tegmina smoky-hyaline tinged with ferruginous; somewhat wrinkled, especially on the rather broad apical margin; base black, coriaceous, coarsely punctate, sparingly pubescent; costal margin of apex very narrowly and faintly marked with light brown; veins in central area of tegmina very heavy, upraised and black; a rather narrow transverse area just following coriaceous base lighter than other parts of tegmen; five apical and two discoidal cells.

Undersurface of body very dark brown, rather closely pubescent with silvery hairs; coxae, trochanters and femora dark brown; tibiae and tarsi ferruginous; tibiae minutely spined and pilose; hind trochanters strongly armed with teeth on the inner surface.

Length 5.7 mm.; width between extremities of humeral angles 2.8 mm.

Type: female.

Locality: Sandakan, Borneo.

Type (Baker's duplicate No. 9512) in author's collection; allotype and paratype in Professor Baker's collection.

One tegmen of the type specimen shows three discoidal cells instead of two, a variation not unusual in the tegmina of the sub-family Centrotinae and an evidence of the fact that the number of discoidal cells is not a reliable character for specific diagnosis.

### 30. *Centrotoscelus pseudocornis* sp. nov. (Figs. 13 and 14).

Small, black, with slight protuberances which resemble horns above the humeral angles; posterior process just reaching internal angles of tegmina; tegmina smoky-hyaline except base which is black and punctate; tibiae and tarsi ferruginous.

Head wider than long, black, roughly sculptured, densely pubescent with silvery hairs; base strongly sinuate; eyes large, prominent, brown; ocelli small, brown, glassy somewhat farther from each other than from the eyes and situated slightly above a line drawn through centres of eyes; inferior margins of genae sloping, weakly sinuate, flanged; antennae very fine but visible; clypeus about twice as long as wide, black, densely pubescent, projecting for half its length below inferior margins of genae, tip rounded and pilose.

Pronotum black, finely punctate, closely pubescent with silvery hairs; metopidium convex, broader than high, a black callosity over the internal angle of each eye, barely carinate on inferior half; humeral angles large, prominent, triangular, blunt; a strong ridge suggesting an undeveloped horn above each humeral angle; median carina strong on posterior half of pronotum, weak over humeral angles and almost obsolete on metopidium; scutellum plainly ex-

posed on each side; posterior process short, heavy, tectiform, median dorsal ridge high, tip blunt and just reaching internal angles of tegmina.

Tegmina smoky-hyaline, tinged with ferruginous; smooth in central region but wrinkled in apical region; base black, coriaceous, finely punctate, sparingly pubescent; veins of central costal area heavy and brown; five apical and two discoidal cells.

Undersurface of body black, punctate and pubescent; sides of abdominal segments grayish with sharp black punctures; coxae, trochanters and basal half of femora black; distal half of femora lighter; tibiae and tarsi ferruginous; hind trochanters armed on inner surface with strong teeth.

Length 4.3 mm.: width between tips of humeral angles 2.3 mm.

Type: male (Baker's duplicate No. 9384).

Locality: Island of Penang.

Type in author's collection.

This species is most interesting in that it shows a tendency to a transition towards the genus *Tricentrus*. It very closely approaches *Tricentrus brevicornis* described above (No. 26) and might be placed in the same genus as the latter species if the suprahumeral ridges were somewhat more prominent. In general facies, however, *Centrotoscelus pseudocornis* has more affinities towards *Centrotoscelus* than towards *Tricentrus* and must be placed for the present in the former genus. It may be that additional forms from these two genera will show that the presence or absence of suprahumeral horns will not constitute a sufficient generic character as has hitherto been supposed.

One male from the Island of Penang.

### 32. *Gargara projecta* Funkhouser.

One male and two females from the Island of Penang. As in the type material from Singapore, the male is somewhat smaller and darker than the female but is easily identified by the projecting head and clypeus. One female bears Baker's duplicate No. 9393 and the male the duplicate No. 9396. The species has already been reported from the Island of Penang.<sup>1</sup>

### 33. *Gargara attenuata* Funkhouser.

1914. *Gargara attenuata* Funkh. Journ. N. Y. Ent. Soc. XXII: 3, p. 236, 4, Fig. 4.

Two females from the Island of Penang and one male and one female from Sandakan, Borneo. One female from the Island of Penang bears Baker's duplicate No. 9392. The male from Borneo is numbered 9832 and the female 9831. This species was described from Banguay; the specimens here recorded agree in all respects with the type material with which they have been compared.

1. Journ Straits Branch R. A. Soc., No. 79, p. 11, 1918.

**34. *Gargara nitidipennis* Funkhouser.**

*Add*—Locality: Sandakan, Borneo.

One male. It has been remarked that this species seems to show remarkable variation in size without other characters which would warrant the dividing of the species. The Borneo specimen agrees very closely with the original type material from Los Baños with which it has been compared.

**35. *Gargara tuberculata* Funkhouser.**

1914. *Gargara tuberculata* Funkh. Journ. Ent. & Zoo. VI: 2, p. 70, No. 12, Fig. 6.

1914. *Gargara tuberculata* Funkh. Journ. N. Y. Ent. Soc. XXII: 3, p. 235.

1915. *Gargara tuberculata* Funkh. Review Phil. Memb. p. 398.

1918. *Gargara tuberculata* Funkh. Notes Phil. Memb. p. 32.

One male from the Island of Penang. Easily recognized by the tuberculate tegmina.

**36. *Gargara luconica* Fairmaire.**

1846. *Membracis luconica* Fairm. Rev. Memb. 255, 45.

1851. *Enchenopa luconica* Walk. List Hom. Brit. Mus. 484, 18.

1870. *Gargara luconica* Stal. Hem. Phil. 728, 1.

1915. *Gargara luconica* Funkh. Phil. Memb. p. 395.

1918. *Gargara luconica* Funkh. Notes Phil. Memb. p. 38.

A pair from the Island of Penang and a pair from Sandakan, Borneo. The male from the Island of Penang bears Baker's duplicate No. 9391 and the female 9390. The Borneo specimens are unnumbered.

**37. *Gargara pygmaea* Walker.**

1851. *Centrotus pygmaeus* Walk. List Hom. Brit. Mus. 630, 75.

1910. *Gargara pygmaea* Banks Phil. Journ. Sci. V: 48, 35.

1915. *Gargara pygmaea* Funkh. Phil. Memb. p. 396.

1918. *Gargara pygmaea* Funkh. Notes Phil. Memb. pp. 32, 38.

One male from the Island of Penang.

**38. *Gargara rubrogranulata* Bierman.**

*Add*—Localities: Island of Penang; Sandakan, Borneo.

One female from Singapore, two females from the Island of Penang and one female from Borneo. The species has already been reported from Singapore but the other localities are new.

**39. *Gargara rugonervosa* Funkhouser.**

1918. *Gargara rugonervosa* Funkh. Notes Phil. Memb. p. 54.

One female from Sandakan, Borneo.

**40. *Gargara piceola* Melichar.**

*Add*—Localities: Island of Penang; Sandakan, Borneo.

Four females from Borneo; one male and two females from the Island of Penang. The Borneo specimens bear Baker's duplicate Nos. 9397, 9529, 9834 and 9835. One of the females from Borneo is numbered 9389.

**41. *Gargara nigrofasciata* Stal.**

1870. *Gargara nigrofasciata* Stal Hem. Phil. 729, 5.

1914. *Gargara nigrofasciata* Funkh. Journ. Ent. & Zoo. VI: 2, p. 70, no. 10.

1914. *Gargara nigrofasciata* Funkh. Journ. N. Y. Ent. Soc. XXII: 3, p. 235.

1915. *Gargara nigrofasciata* Funkh. Phil. Memb. p. 398.

1917. *Gargara nigrofasciata* Funkh. Memb. Cay. Lake Bas. Pl. 30, Fig. 12.

1918. Funkh. Notes Phil. Memb. p. 32.

One male and three females from Sandakan, Borneo. The male bears Baker's duplicate No. 9525 and one of the females the No. 9523. The Borneo material shows no variation from a long series of specimens collected in various parts of the Philippine Islands by Professor Baker and by Mr. R. C. McGregor of Manila.

**42. *Gargara pulchripennis* Stal.**

1870. *Gargara pulchripennis* Stal Hem. Phil. 729, 4.

1914. *Gargara pulchripennis* Funkh. Journ. Ent. & Zoo. VI: 2, p. 70, No. 11.

1915. *Gargara pulchripennis* Funkh. Phil. Memb. p. 398.

1917. *Gargara pulchripennis* Funkh. Memb. Cay. Lake Bas. Pl. 32, Fig. 6.

1918. *Gargara pulchripennis* Funkh. Notes Phil. Memb. p. 32.



Three males and three females from Sandakan, Borneo. Two of the males bear respectively Baker's duplicate Nos. 9402 and 9530 and one of the females No. 9527.

As in the case of the preceding species, these specimens agree in all respects with Philippine material.

**43. *Gargara maculipennis* Funkhouser.**

1918. *Gargara maculipennis* Funkh. Notes Phil. Memb. p. 32.

Three females from Sandakan, Borneo, one bearing Baker's duplicate No. 9526. These specimens are considerably smaller than the types from the Philippines and differ slightly in markings. They may represent a new variety but I should hesitate to set them off as such without having a longer series available for study.

**44. *Gargara varicolor* Stal.**

1870. *Gargara varicolor* Stal Hem. Phil. 728, 3.

1914. *Gargara varicolor* Funkh. Journ. Ent. & Zoo. VI: 2, p. 69.

1915. *Gargara varicolor* Funkh. Phil. Memb. p. 397, Pl. 2, Fig. 18.

1918. *Gargara varicolor* Funkh. Notes Phil. Memb. pp. 32, 38.

One female from Sandakan, Borneo.

**45. *Gargara affinis* Distant.**

1907. *Gargara affinis* Dist. Fauna Brit. Ind. p. 61, no. 2192.

1914. *Gargara affinis* Funkh. Journ. N. Y. Ent. Soc. XXII: 3, p. 236.

A pair from Sandakan, Borneo, the male bearing Baker's duplicate No. 9833. I have what is apparently the same species from Banguay.

**46. *Gargara citrea* Distant.**

1907. *Gargara citrea* Distant Fauna Brit. Ind. p. 63, no. 2197.

1916. *Gargara citrea* Dist. Fauna Brit. Ind. App. p. 170.

Two females from Sandakan, Borneo, bearing respectively Baker's duplicate Nos. 9395 and 9522.

**47. *Gargara mixta* Buckton.**

1903. *Maerops mixtus* Buckt. Mon. Memb. p. 257, Pl. 69, Figs. 8, 8a.

1903. *Maerops mixtus* Buckt. idem. p. 266.  
 1903. *Gargara variegata* Melichar Hom. Ceylon, p. 123.  
 1907. *Gargara mixta* Dist. Fauna Brit. Ind. p. 65.  
 1907. *Gargara mixta* Lefroy Ind. Ins. Life, p. 732.  
 1916. *Gargara mixta* Dist. Fauna Brit. Ind. App. p. 171.

Two males and one female from Sandakan, Borneo. One of the males bears Baker's duplicate No. 9829 and the female is numbered 9830.

If the above synonymy is correct as I believe it to be since Distant has compared Buckton's type of *M. mixtus* with a cotype of Melichar's *G. variegata*, this insect has a very wide range and it is not surprising that it should be here recorded from Borneo.

From the material which I have seen belonging to this species I judge that it shows considerable variation or that perhaps there are several varieties. I have never recognized Distant's variety *nandidrugana* which he states may be a distinct species.

#### 48. *Gargara pilinervosa* sp. nov.

Small, dark brown, finely punctate, densely pubescent; posterior process not reaching internal angles of tegmina; tegmina hyaline, base black, transverse brown fascia across central area, veins very strongly pilose and somewhat nodulate; undersurface of body brown; femora brown, tibiae and tarsi luteous.

Head wider than long, the black color and fine punctuation almost entirely hidden by the very dense silvery pubescence; base strongly sinuate; eyes large, prominent, grayish-brown; ocelli small, pearly, at least twice as far from each other as from the eyes and situated well above a line drawn through centres of eyes; inferior margins of genae sloping, sinuate; antennae long, prominent; clypeus longer than wide, black, punctate, very densely pubescent, extending for about half its length below inferior margins of genae, tip rounded, flanged and sparingly pilose.

Pronotum dark brown, punctate, very densely pubescent with silvery hairs especially over anterior half; metopidium wider than high, sloping, slightly convex along median line; humeral angles large, prominent, triangular, auriculate, blunt; median carina faintly percurrent, strong on posterior process but almost obsolete on metopidium; dorsum weakly convex, slightly depressed above scutellum; scutellum plainly exposed on both sides, punctate, pubescent; posterior process short, heavy, blunt, strongly ridged above, somewhat lighter in color than the rest of the pronotum, extending only a short distance beyond scutellum and not nearly reaching the internal angles of the tegmina.

Tegmina hyaline except at base which is black, coriaceous, punctate and pubescent; across the central area is a transverse brown fascia extending from the internal angle and becoming grad-

usually wider until it reaches the costal margin; veins very strongly pilose throughout and slightly nodulate near base; five apical and two discoidal cells.

Undersurface of body dark brown or black. Coxae, trochanters and proximal ends of femora black; distal ends of femora ferruginous; tibiae and tarsi yellow.

Length 3.6 mm.; width between tips of humeral angles 1.7 mm.

Type: female.

Locality: Sandakan, Borneo.

Unique type in Professor Baker's collection.

#### 49. *Gargara nigra* sp. nov.

Entirely black except eyes and tarsi which are yellow-brown; posterior process straight, tip slightly decurved and extending just beyond internal angles of tegmina; tegmina entirely black, opaque; undersurface of body black.

Head wider than long, black, finely punctate, rather strongly pubescent with very short silvery hairs; base sinuate; eyes very large, prominent, shining, yellow-brown with brown spots; ocelli small, whitish-yellow, glistening, twice as far from each other as from the eyes and situated well above a line drawn through centres of eyes; inferior margins of genae sloping, sinuate; antennae very fine, not prominent; clypeus about as long as wide, black, punctate, pubescent, extending for about one-third its length below inferior margins of genae, tip rounded, slightly flanged.

Pronotum entirely black, finely punctate, sparingly pubescent with very short silvery hairs; metopidium wider than high, sloping, no central carina, an irregular callosity above internal angle of each eye; humeral angles large, prominent, triangular, blunt; median dorsal carina not percurrent, distinct on posterior process, only slightly visible above humeral angles and entirely obsolete on metopidium; dorsum nearly straight, only slightly convex above metopidium; scutellum plainly visible on each side, black, punctate; posterior process slender, straight, entirely black, finely punctate, sparsely pubescent, tip slightly deflexed and extending a little beyond internal angles of tegmina but not nearly reaching tip of abdomen.

Tegmina entirely black, opaque; base slightly punctate, coriaceous; veins black, prominent, inclined to be finely nodulate; five apical and two discoidal cells.

Undersurface of body entirely black, punctate, sparingly pubescent. Legs entirely black except the extreme tips of the tibiae and the tarsi which are yellow-brown.

Length 3.9 mm.; width between tips of humeral angles 2 mm.

Type: female.

Locality: Sandakan, Borneo.

Type (Baker's duplicate No. 9524) in author's collection.

In the type specimen the outer discoidal cell on one tegmen is subdivided but the other tegmen is normal.

**50. *Parayasa maculipennis* sp. nov. (Fig. 15).**

Shining black; tegmina with three long and one very short white fasciae and four large apical cells; posterior process strongly sinuate and not nearly reaching to internal angles of tegmina; ocelli very much farther from each other than from the eyes; under-surface of body black; legs dark brown.

Head very convex, about as long as broad, black, shining, punctate, very sparingly pubescent at lateral basal angles; eyes large, prominent, yellowish-white with brown markings near inner margins; ocelli small but very prominent, yellowish, glassy, glistening, very much farther from each other than from the eyes and situated near the lateral margins of the head somewhat above a line drawn through centres of eyes; inferior margins of genae short and nearly straight; clypeus much deflexed, convex, black, shining, finely punctate, extending for two-thirds its length below the inferior margins of the genae, tip rounded, somewhat swollen, sparingly pubescent.

Pronotum entirely black, finely punctate, shining, very faintly pubescent; metopidium sloping, broader than high, slightly depressed above eyes, black, shining, finely punctate; humeral angles very broad, prominent, auriculate, blunt; dorsum strongly sinuate, a depression just behind humeral angles and another in centre of posterior process, between these depressions much swollen; median dorsal carina very faintly percurrent; posterior process short, heavy, blunt, a swollen elevation at base and at tip, faintly carinate along median dorsal line, tip rounded and not nearly reaching internal angles of tegmina; scutellum not exposed when tegmina are closed.

Tegmina black, opaque, shining; base coriaceous and punctate; veins noticeably pilose; four shining white linear fasciae extending across the tegmen at various angles as follows: one very short white line extending from centre of margin of posterior process across the clavus caudo-ventrad to the fold of the corium; another white line extending entirely across the tegmen diagonally from the tip of the posterior process cephalo-ventrad to the costal margin near the edge of the basal punctuation; another wider white line beginning on the costal margin about two-thirds of the distance from the base and extending cephalo-dorsad about half-way across the tegmen; another broad white fascia extending across the tip of the tegmen just inside the apical veins. The tegmen has four large apical cells and two discoidal.

Undersurface of body entirely black; sides of metathorax thickly white tomentose; legs uniformly dark brown.

Length 3.4 mm.; width between tips of humeral angles 1.7 mm.

Type: female.

Locality: Sandakan, Borneo.

Unique type in Professor Baker's collection.

In erecting the genus *Parayasa*, Distant gives as one of the generic characters the position of the ocelli as about equidistant from each other and from the eyes. This is certainly not the case in the species here described, although I believe it unquestionably belongs to the genus as designated. I think, also, that the fact that the scutellum is not exposed in the insects of this genus should be stated as an aid to identification.

#### EXPLANATION OF PLATE.

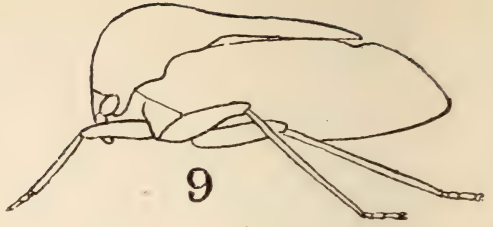
- Fig. 1. Lateral outline of *Centrotypus brunneus* sp. nov.
2. Frontal outline of *Centrotypus brunneus* sp. nov.
3. Lateral view of *Anchonoides serpentinus* sp. nov.
4. Front view of head and pronotum of *Anchonoides serpentinus* sp. nov.
5. Lateral outline of *Tricentrus nigris* sp. nov.
6. Frontal outline of *Tricentrus nigris* sp. nov.
7. Lateral outline of *Tricentrus brevicornis* sp. nov.
8. Frontal outline of *Tricentrus brevicornis* sp. nov.
9. Lateral outline of *Centrotoscelus borneensis* sp. nov.
10. Frontal outline of *Centrotoscelus borneensis* sp. nov.
11. Lateral view of *Centrotoscelus brevispinis* sp. nov.
12. Frontal view of head and pronotum of *Centrotoscelus brevispinis* sp. nov.
13. Lateral outline of *Centrotoscelus pseudocornis* sp. nov.
14. Frontal outline of *Centrotoscelus pseudocornis* sp. nov.
15. Lateral view of *Parayasa maculipennis* sp. nov.



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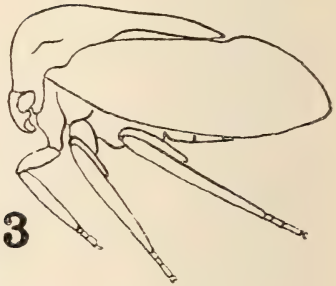
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